

## **CHAPTER 3**

### **PLANNING AREA CHARACTERISTICS**

A plan to help guide the delivery of the City of Lincoln's wastewater system utility services to future development areas is a fundamental part of the facilities plan update. The amount of land area needed for development has a general correlation to population. Therefore, it can be assumed that as the City's population increases, a proportional amount of additional land will require wastewater service.

A 25-year planning period, beginning in 2000 and ending in 2025, was established in the Lincoln-Lancaster County Comprehensive Plan. Projected populations for a 50-year period, from the year 2000 through 2050, were developed based on supplemental information received from the Lincoln-Lancaster County Planning Department to provide the long term wastewater service information required for this facilities plan update. Based on projected population figures, land area growth requirements were estimated and associated improvements to the Lincoln wastewater collection and treatment systems were identified.

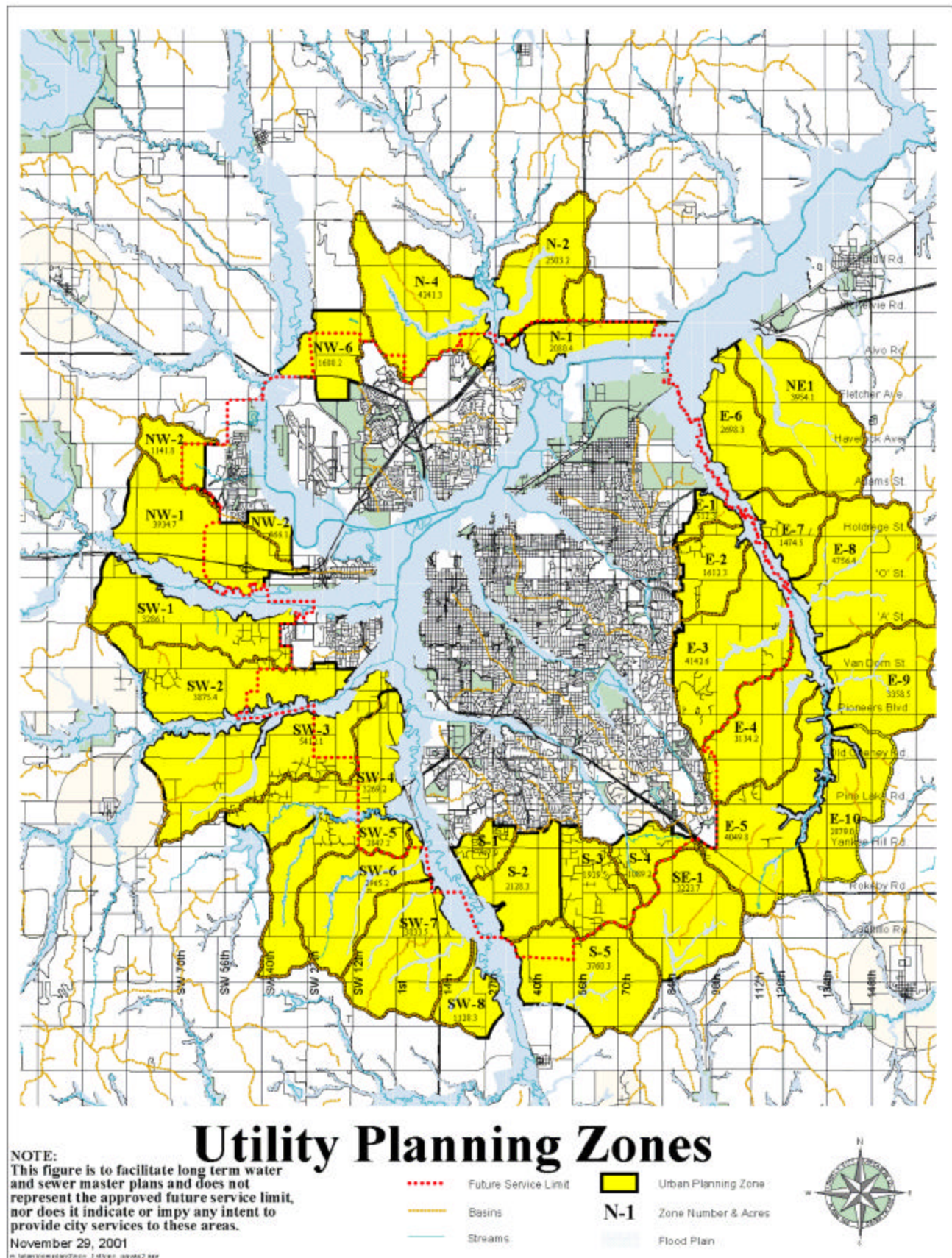
The anticipated growth pattern from 2000 to year 2025 was derived from projections made in the 2002 Lincoln-Lancaster County Comprehensive Plan. This chapter reviews existing population distribution and growth trends, and presents population projections and anticipated growth areas for the 25-year period beginning in 2000.

#### **Study Area Boundaries**

The study area includes:

1. The entire City of Lincoln, Nebraska;
2. Portions of the Middle Creek and Haines Branch basins to the west;
3. Cardwell Branch, located in the southwest;
4. The Upper Salt Creek and Beals Slough areas to the south;
5. Little Salt Creek and Lynn Creek drainages to the north and northwest;
6. Northeast Salt Creek drainage to the north and northeast; and
7. Stevens Creek to the east.

The study area is shown on Figure 3-1. The entire study area encompasses approximately 296 square miles, of which only about 79 square miles are presently served by the City's sanitary sewer system. Because future growth details cannot be known at this time, this facilities plan addresses future wastewater collection and treatment needs only in a general way.



## Physical Characteristics

The City of Lincoln's wastewater collection system currently serves 13 drainage basins. These basins vary in size and type of land development. Wastewater generated in ten of these areas is treated at the Theresa Street WWTF located at 2400 Theresa Street. These areas include:

1. Salt Creek
2. West "O" Street
3. Beals Slough
4. Haines Branch
5. Middle Creek
6. Antelope Creek
7. East Campus
8. Oak Creek
9. Little Salt Creek
10. Lynn Creek

The Northeast WWTF, located at 7000 North 70th Street, handles wastewater generated in the remaining three basins:

1. Deadmans Run
2. Havelock
3. Regent Heights (portion of West Stevens Creek drainage basin)

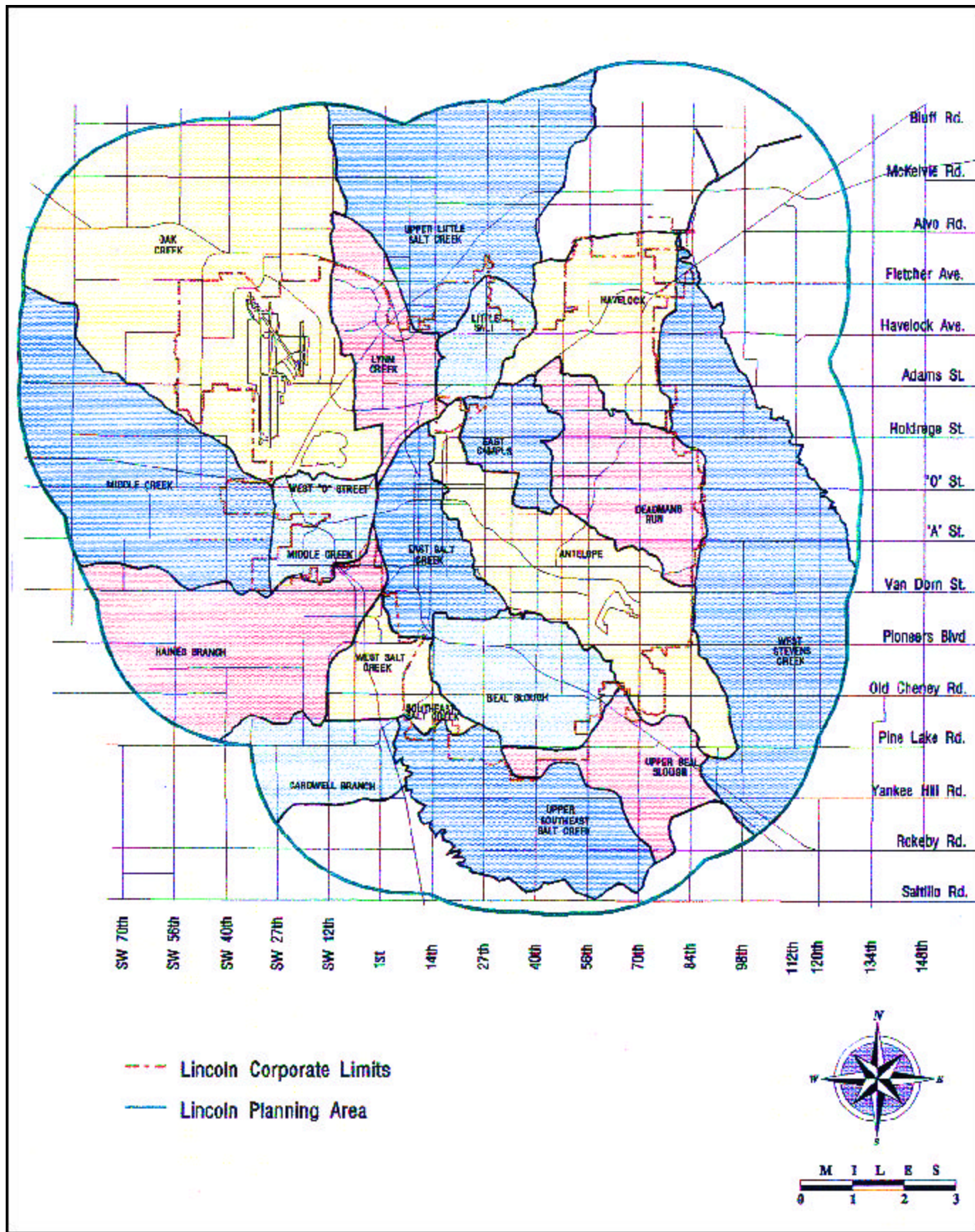
Figure 3-2 shows the location of each of these drainage basins.

There is an interconnection between those portions of the collection system which transport wastewater to the Northeast WWTF and those portions of the system that convey wastewater to the Theresa Street WWTF. The connection is located in the Deadmans Run drainage and provides the capability to divert wastewater that would normally flow to the Northeast WWTF to the Theresa Street facility. Based on current wastewater flow rates, flows of up to about 4 mgd can be "redirected" from the Northeast WWTF to the Theresa Street WWTF using this interconnection.

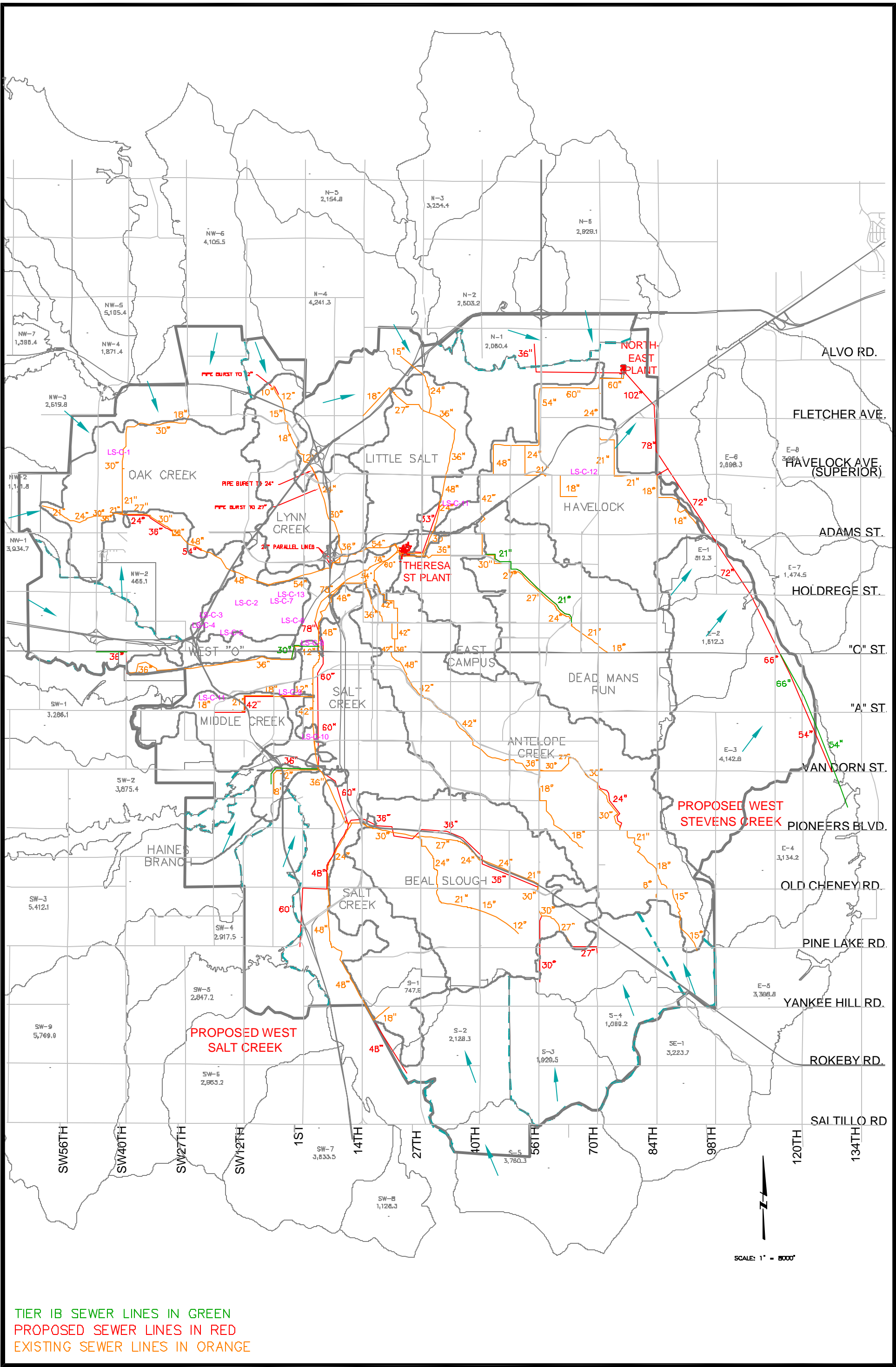
Growth within the 25-year planning period is anticipated primarily in drainage basins currently being served by the wastewater system. As these basins become fully developed (e.g., Antelope, Beals Slough, and Lynn Creek) and as population growth continues, new service areas will need to be developed.

The 2002 Lincoln-Lancaster County Comprehensive Plan has divided projected wastewater service needs into Tier I and Tier II needs. Tier I needs represent those needs that are expected to occur from 2000 through 2025. Tier II needs are expected to occur between 2025 and 2050. Tier I needs have been further categorized as either Priority A or Priority B needs. Priority A needs being those that are expected to occur during the period from 2000 through 2012. Priority B needs are those that are expected to occur between 2013 and 2025. The Tier I Priority A and B service area needs are shown in Figure 3-3.





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Lincoln Wastewater System Facilities Plan Update  
CITY OF LINCOLN  
SANITARY SEWER BASINS



**MWH**  
MONTGOMERY WATSON HARZA

Figure 3-3  
TIER 1 PRIORITY A AND B NEEDS

## **100-Year Flood Plain Areas**

The City of Lincoln has enacted a flood plain management program which restricts growth within the 100-year floodplain. This was accomplished by creating ordinances that prohibit the subdivision of land parcels or platting within the 100-year floodplain unless certain restrictive conditions are met. Zoning ordinances also prohibit encroachments in the floodway and impose certain construction requirements in the floodway fringe. In addition, the City of Lincoln has passed resolutions regulating the creation of special assessment districts in the 100-year floodplain for water, sanitary sewer, storm sewer, sidewalk, and ornamental lighting. The City has given jurisdictional authority to the Building and Safety Department to enforce these ordinances. Based on these regulations, it is anticipated that growth within the 100-year floodplain will be minimal in the foreseeable future.

## **Planning Agencies**

The 2003 Wastewater Facilities Plan Update will be used by many different groups within the City, and certain agencies outside the City, to formulate plans to manage growth in the Lincoln area. During the formulation of this facilities plan update, a concerted effort was made to keep these groups and agencies involved. The groups include:

1. Lincoln-Lancaster County Planning Department
2. City of Lincoln Department of Public Works and Utilities
3. Nebraska Department of Environmental Quality (NDEQ)
4. U.S. Environmental Protection Agency (US EPA)

## **Existing Land Usage**

The City of Lincoln and Lancaster County are using the Lincoln-Lancaster County Comprehensive Plan to guide their planning and land-use activities. The land-use plans reflect an approach to addressing the following basic concerns of the community:

1. Continued development of downtown as the heart of the community; a center of employment, culture, entertainment, and government; the clearly dominant multi-use center.
2. Development of a compact and generally contiguous urban form for the City of Lincoln.
3. Development of a roadway network around the perimeter of the City of Lincoln.
4. Development of infrastructure such as roads, water, sewer, parks, stormwater, schools, libraries, and open space concurrent with land development.
5. Development of detailed sub-area plans for developing areas of the City, the urban environment, and the rural environment.

6. Development of a close relationship between the comprehensive plan, land-use regulations, and the capital improvements program.
7. Development of multiple public-use corridors for trails, parks, stormwater drainage, utilities, etc.
8. Consideration of the natural and “man-made” environments in all development actions.

The existing and future land-use plans within the City of Lincoln will direct growth to specific drainage basins to ensure orderly expansion and to control expenditures for water and sewer infrastructure improvements. The plans acknowledge that Lincoln’s existing neighborhoods are important resources that must be protected and, if necessary, revitalized. The plans seek to maximize benefits from land already within the urban area through infill development on underutilized sites. These strategies emphasize reliance on maximum feasible utilization of existing public facilities including roadways, utilities, schools, and libraries before constructing new public facilities in other locations. In some instances, rebuilding or expanding deficient facilities within the existing urban area will be necessary.

## **Population Growth**

This section presents historical population growth trends and projects future population growth based on these trends.

**Historical Populations.** Historical population data were supplied by the Lincoln-Lancaster County Planning Department. The source for the population trends from 1880 to 2000 is the U.S. Bureau of Census. Historical population growth for the City of Lincoln and Lancaster County is shown in Table 3-1.

**Table 3-1. Historical City/County Population Growth**

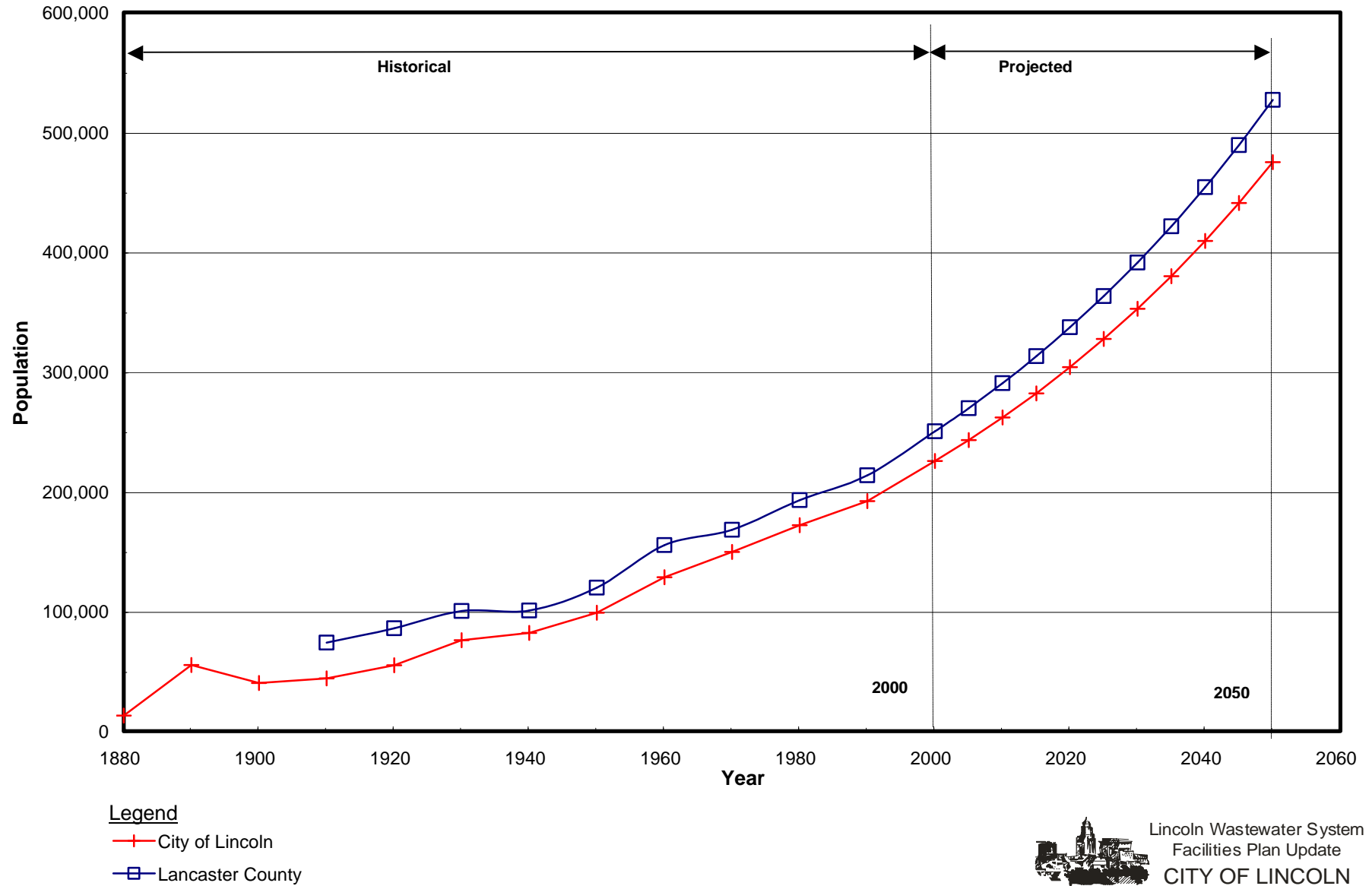
<b>Year</b>	<b>City of Lincoln</b>	<b>Annual % Increase</b>	<b>Lancaster County</b>	<b>Annual % Increase</b>
1880	13,003	-		
1880-1890	13,003 - 55,154	15.6		
1890-1900	55,154 - 40,169	3.1		
1900-1910	40169 - 43,973	0.9	73,793	-
1910-1920	43,973 - 54,948	2.3	73,793 - 85,902	1.5
1920-1930	54,948 - 75,933	3.3	85, 902 - 100,324	1.6
1930-1940	75,933 - 81,984	0.8	100,324 - 100,585	0.0
1940-1950	81,984 - 98,884	1.9	100,585 - 119,742	1.8
1950-1960	98, 884 - 128,521	2.7	119,742 - 155,272	2.6
1960-1970	128,521 - 149,518	1.5	155,272 - 167,972	0.8
1970-1980	149,518 - 171,932	1.4	167,972 - 192,884	1.4
1980-1990	171, 932 - 191,972	1.1	192,884 - 213,461	1.0
1990-2000	191, 972 - 225,581	1.6	213,461 - 250,291	1.6

Table 3-1 shows that in recent years the City of Lincoln and Lancaster County have both sustained moderate population growth. The population growth rate for the last 30 years for the City of Lincoln has averaged 1.38 percent per year, and for Lancaster County 1.34 percent per year.

**Population Projections.** Because wastewater collection systems and some treatment plant components typically have 50-year design lives, it is advantageous to project population growth for a 50-year period. This report estimates future wastewater utility needs for 25-year and 50-year planning horizons using population projections provided by the Lincoln-Lancaster County Planning Department as shown in Table 3-2. Graphs of data in Table 3-1 and Table 3-2 are shown in Figure 3-4.



Figure 3-4  
Historical and Projected Populations for the  
City of Lincoln and Lancaster County



**Table 3-2. City/County Population Projections**

<b>Year</b>	<b>City of Lincoln</b>	<b>Annual % Increase</b>	<b>Lancaster County</b>	<b>Annual % Increase</b>
2001	225,581	1.5	250,291	1.5
2005	243,015	1.5	269,634	1.5
2010	261,796	1.5	290,473	1.5
2015	282,029	1.5	312,922	1.5
2020	303,825	1.5	337,106	1.5
2025	327,306	1.5	363,159	1.5
2030	352,601	1.5	391,225	1.5
2035	379,852	1.5	421,460	1.5
2040	409,208	1.5	454,032	1.5
2045	440,833	1.5	489,122	1.5
2050	474,903	1.5	526,923	1.5

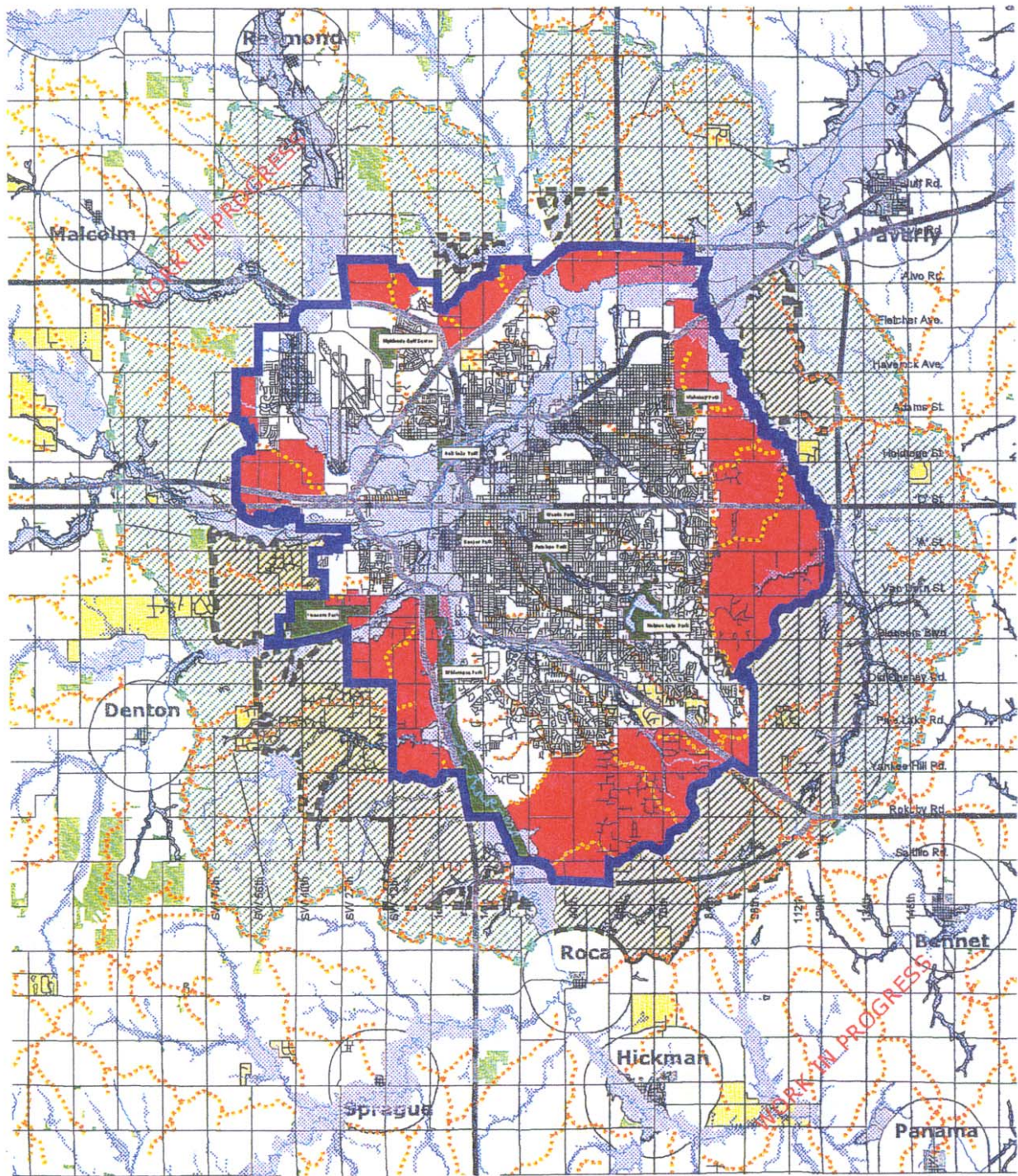
The population projections provided by the Lincoln-Lancaster County Planning Department and shown in Table 3-2 indicate that the present growth trend is expected to continue. During the 25-year Tier I planning period, the result will be the addition of approximately 102,000 and 113,000 persons to the 2000 population for the City of Lincoln and Lancaster County respectively. Using a moderate annual growth rate of 1.5 percent, the calculated population increase from the year 2000 through the year 2050 is approximately 249,000 for the City of Lincoln, and 277,000 for Lancaster County. The projected service area for the year 2025, shown on Figure 3-5, was taken from the Lincoln-Lancaster County Comprehensive Plan.

### **Collection System Land-Use Plan**

As the City's population has grown historically, new land areas have been developed to accommodate the growth. In planning for future growth in the City of Lincoln and its impact on the wastewater system, the land-use plan described in the Lincoln-Lancaster Comprehensive Plan was utilized. The population growth associated with this land-use plan served as the basis for projecting collection system improvements and treatment needs through the year 2025.

Total land area needed for future growth was derived using present demographic information obtained from the City planning department. Wastewater planning decisions should incorporate enough flexibility to accommodate possible variations in future growth conditions within the City. The Lincoln-Lancaster Comprehensive Plan addresses growth in detail and provides specific direction for planned growth.





## Draft - Planning Commission - Urban Growth Tiers

Lincoln- Lancaster County Comprehensive Plan

Lincoln- Lancaster County, Nebraska

April 4, 2002  
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TIER I  
TIER II  
TIER III

ACREAGES  
PROPOSED FUTURE SERVICE LIMIT  
PREVIOUS PROPOSED FUTURE SERVICE LIMIT

Basins  
PRAIRIE  
FLOODPLAIN



BROWN AND  
CALDWELL

MWH  
MONTGOMERY WATSON HARZA



Lincoln Wastewater System  
Facilities Plan Update  
CITY OF LINCOLN

Figure 3-5  
Projected Service Area - 2025